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A5T TBD
A5B BZ

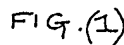
(56) Documents cited

GB 2246299 A	GB 2178965 A	GB 2129691 A
GB 1562732 A	GB 1387954 A	WO 82/01470 A1

(58) Field of search
UK CL (Edition K) A5B, A5T TBD, B8C CA
INT CL⁸ A61J, A61M
Online databases: WPI

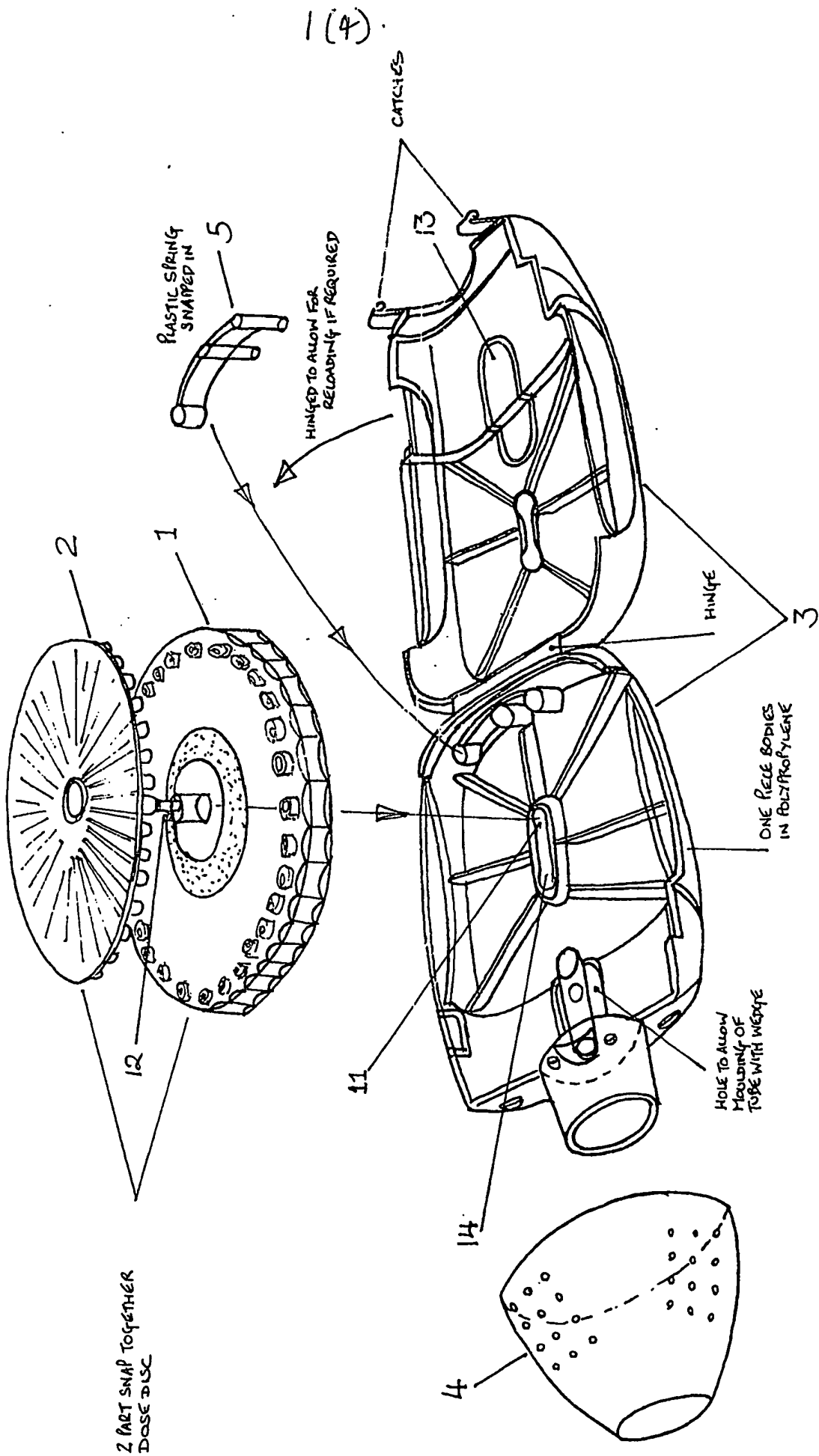
(54) An inhaler

(57) A powder inhaler for use in the treatment of medical problems of the air passages, lungs or bronchial conditions, such as bronchial asthma comprises an openable casing 3 having a mouthpiece and containing a replaceable magazine disc 1, 2 provided with a plurality of recesses or cups, each holding a dose of powder and being individually closed by a discrete closure element which can be opened and then reclosed. The disc may be indexed around to present a closed cap adjacent a projection 16 at the mouthpiece and then moved in the casing transverse to its rotational axis so that the projection removes the closure element. A ring (15, Fig 4) is provided in the top casing portion to assist reclosure of the closure element after inhalation.

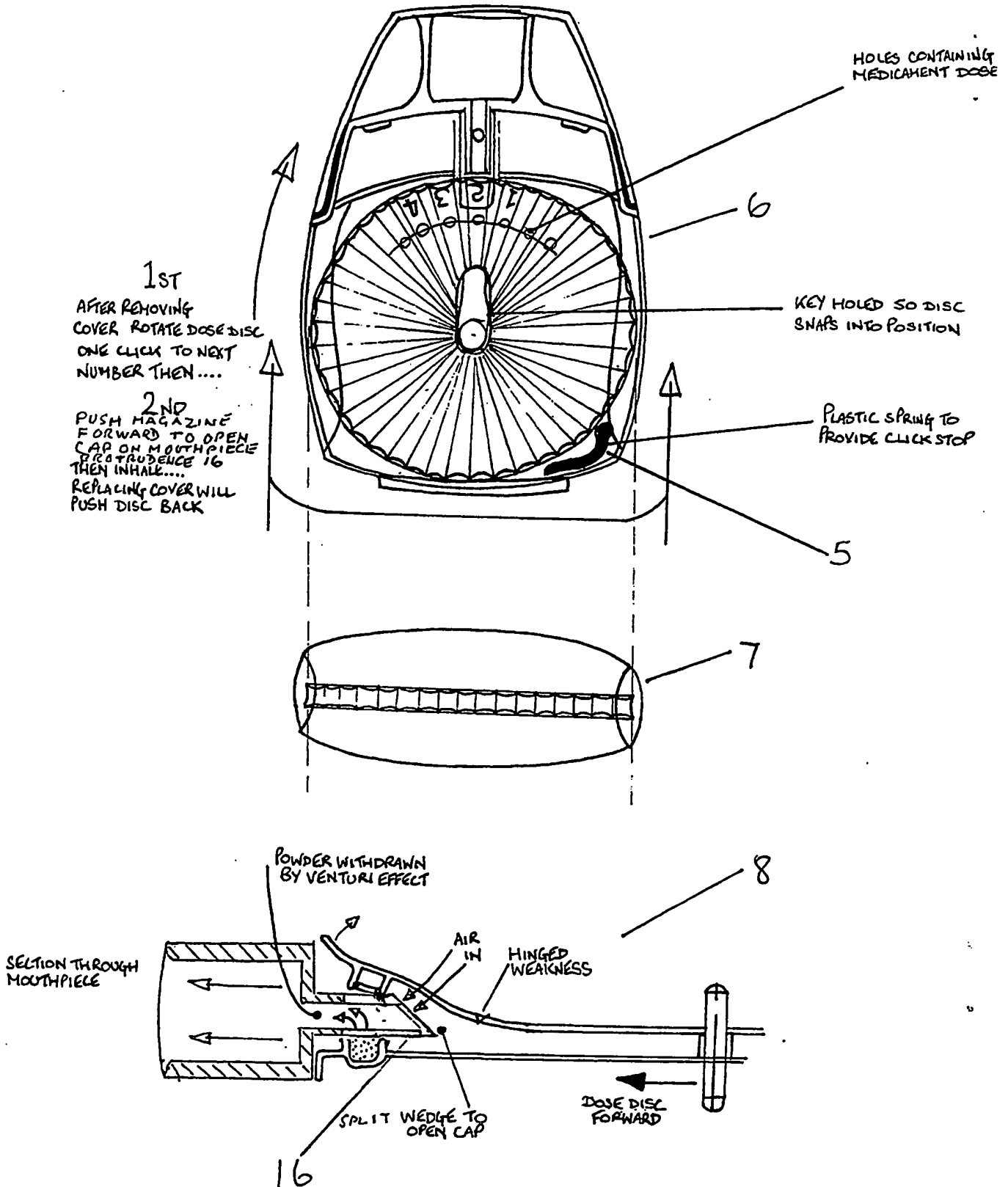


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FIG. (1)



241
FIG. (2)



FIG(3) 3(4)

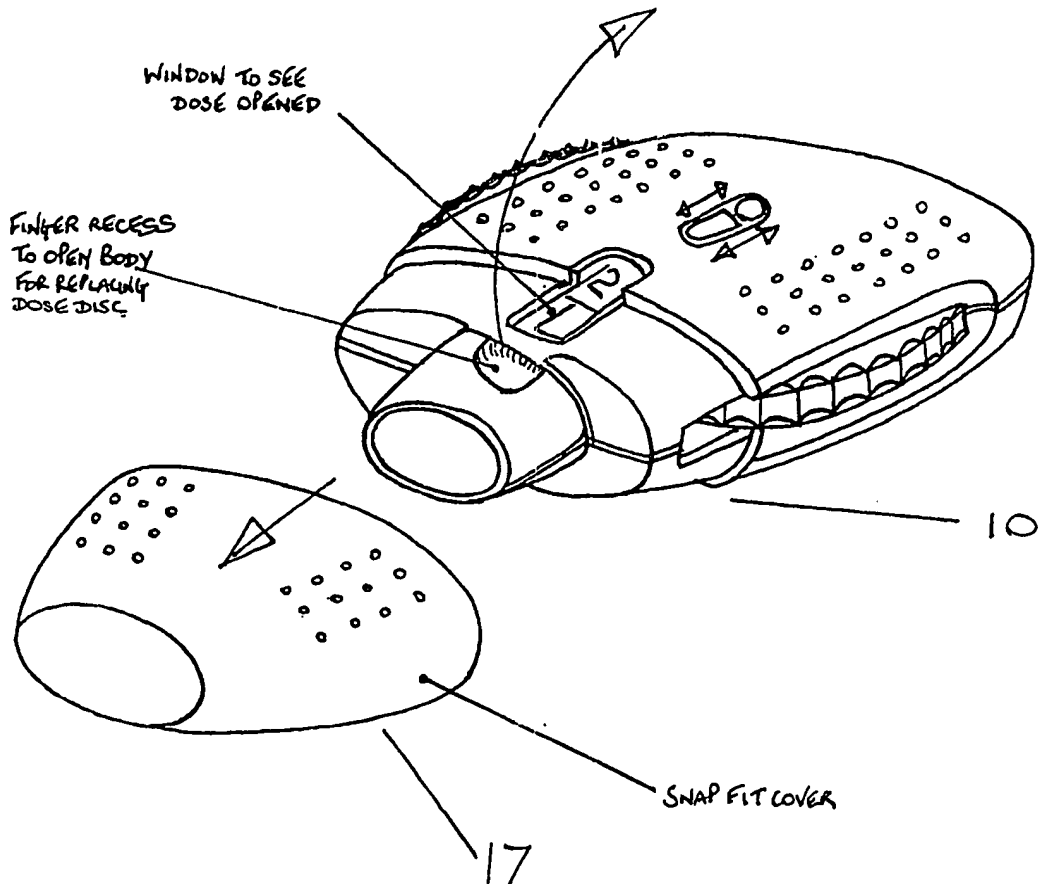
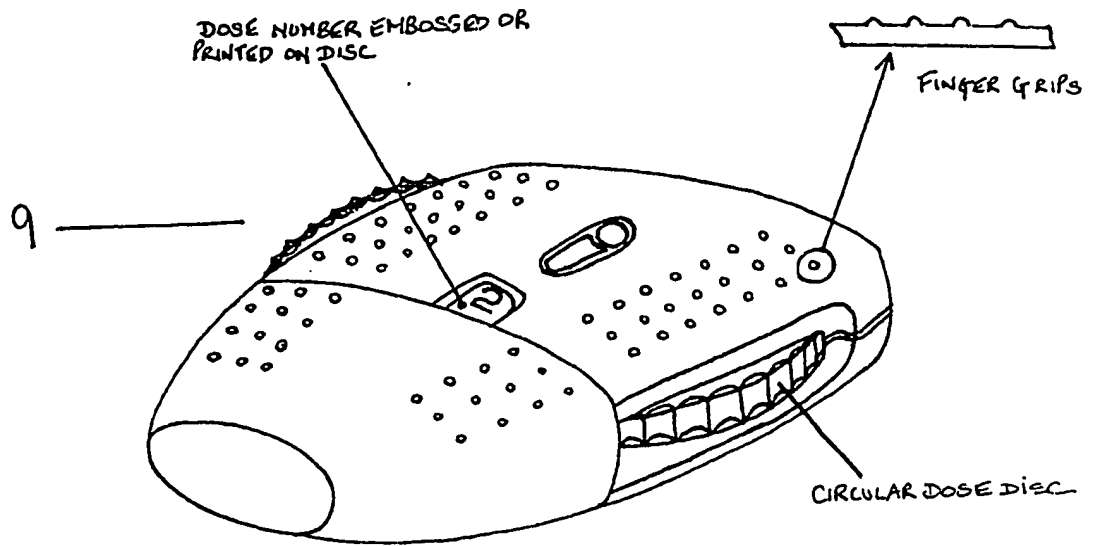
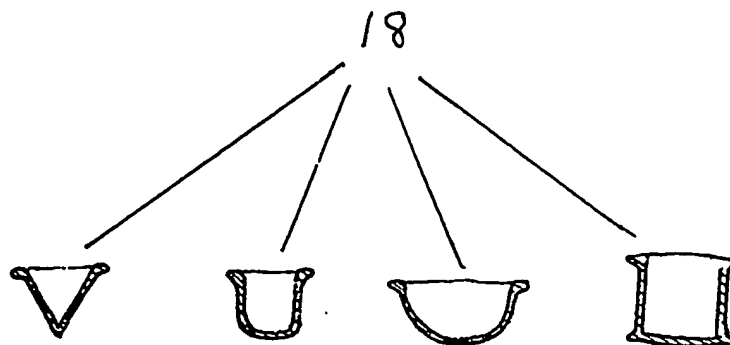
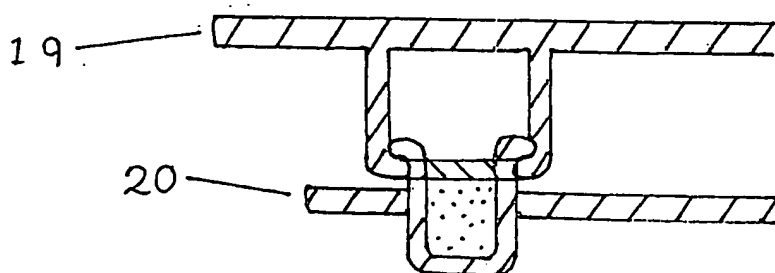


FIG. (4.)

4(4)

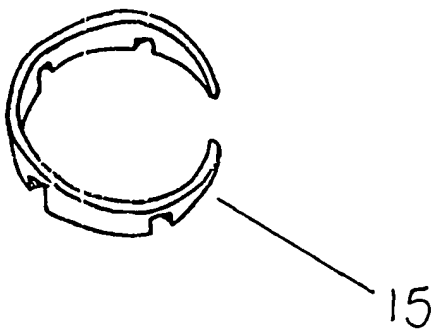


ALTERNATIVE CUP SHAPES



SECTIONAL VIEW OF DOSE
DISC - REF. FIG. 1.
NO'S: 1 AND 2

CAP FITTING OVER POWDERCAP.



TITLE

A magazined device for inhalation of powdered medication to and by patients.

GENERAL BACKGROUND

Devices and systems exist whereby powder for inhalation is enclosed in a gelatine or metal capsule and each capsule is loaded into the device individually each time treatment is required. The capsule is usually broken, cut, pierced, or parted by the device prior to treatment.

Problems can arise with the said capsules e.g. the gelatine or metal breaking into particles which may be inhaled by the patient. Also, gelatine being relatively unstable and fragile, aluminium, also being delicate, both require further packaging for protection to avoid environmental degradation of the product. Also by the very nature of gelatine source a stability problem may also arise.

TECHNICAL FEATURES

According to the present invention there is provided a plastic or metal disc with a plurality of holes or recesses, or cups, around the periphery of the disc. Each hole or recess contains one dose of the medicament. Ideally, there would be sufficient dosage for one week to one month's treatment, but it can be less or more. Each dose is capped off or sealed off to protect the product and maintain product security. The capped circular disc, also known as a magazine is then placed in a dispensing device which enables the doses of powder to be used individually as required by the patient. A specific embodiment will now be described by way of example and with reference to the accompanying drawings:-

FIGURE (1)

Shows in perspective the device with the circular disc 1 showing the recesses or cups to hold the medicament and the individual caps 2 joined at the centre. The case 3 which holds the filled and capped disc (magazine).

The cap 4 which covers the mouthpiece and relocates the capped disc.

The spring 5 which locates each dose when the disc is rotated.

FIGURE (2)

Illustrates rear end view of device 7.

Shows sketch of mouthpiece operation opening cap from powdered dose 8 cup or recess.

FIGURE (3)

Shows the device assembled 9.

Illustrates the cap removed 10.

Referring to the drawing as figure (1), this shows a circular plastic disc with the plurality of holes, cups or recesses each to hold a dose of powder to the exclusion of air 1. Each dose is closed by the caps shown as 2. The closed disc is then located into recess 11 located by pivot 12. The plastic spring 5 is then located in position in the base of the case and preferably located at the first dose to be used. The top of the case is then closed, sealing in the medicament magazine prior to use.

Also shown is the slot in top 13 and bottom 14 of case, which allows magazine containing the doses to be moved forward and

back prior and after inhalation. Also shown is the cap 4 which is included to keep mouthpiece clean and to return dose disc after use. It should be noted that the dose disc and caps are collectively known as the magazine. The magazine is rotated by hand to the next dose prior to inhalation. The magazine is pushed forward by hand, the action of which removes the cap from the required dose. This is shown on Figure (2), as is also the principle by which the powder is inhaled by a venturi effect by the patient. Also shown is a weakness to the hinge 8 to facilitate removal of the cap from the medicament dose container.

5 shows the plastic spring which provides a click stop for each dose when the magazine is rotated. The dose numbers are either embossed or printed on the magazine to ideally decrease when rotated, e.g. 100, 99, 98 etc. This will show how many doses are left. In order to rotate the dose magazine it is shown in Figure (3). the magazine protrudes from the case 3 on both sides enabling the dose magazine to be pushed forward when required. Or rotated as required.

FIGURE (4)

Illustrates alternative cup shapes 18 which hold required doses.

19 and 20 demonstrate cap on cup principle.

15 indicates ring to be clipped into top of case 3 to assist in closing of cap onto cup after inhalation.

CLAIMS

1. A device for administering medicaments in solid finely divided powder form to patients, comprising a magazine containing a plurality of medicament doses each dose individually closed, and an actuating case with mouthpiece to hold magazine.
2. A device according to claim 1. whereby the magazine disc is of a circular shape, individual doses being situated around the periphery of said magazine as 1. and 2. on Figure (1).
3. The magazine is rotatable mounted within case 3 being indexed to the next dose.
4. The magazine is movable in a longitudinal position to open cap against mouthpiece protrudcence 16 for required dose 8.
5. The magazine is movable in a longitudinal position to close cap, reverse of claim 4.
6. A device whereby the required dose in magazine is locked in position by plastic spring 5 on Figure (2).
7. A device whereby the magazine when located within the device is rotatable within the device 10 on Figure (3).
8. A device whereby the cap can be replaced on the device and the dose magazine is moved back by the cap 17 into its original position.
9. A device whereby the shape of the dose cup or recess is influential in promoting a venturi effect 18. Figure (4) shows shape varience.
- 10..A device whereby a circular separate or integral moulding 15 is included in moulding to assist closing of dose cap.

Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

9202469.4

Relevant Technical fields

(i) UK CI (Edition K) A5T TBD; A5B; B8C CA

(ii) Int CL (Edition 5) A61M ; A61J

Search Examiner

J A WALLIS

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASES: WPI

Date of Search

29 APRIL 1992

Documents considered relevant following a search in respect of claims

1 AT LEAST

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2246299 A (GLAXO ETC) Whole document pertinent	1-3 at least
X	GB 2178965 A (GLAXO ETC) Whole document pertinent	1-3, 6, 7, 9 at least
X	GB 2129691 A (GLAXO ETC) Whole document pertinent	1-3 at least
X	GB 1562732 (ALLEN ETC) Eg lines 119, page 2 - line 7 and page 3	1-3 at least
X	GB 1387954 (MILES ETC) Eg. lines 17-26, page 3	1-3 at least
X	WO 82/01470 A1 (RIKER ETC) Eg. magazines and doses 11	1-3 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).